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ABSTRACT

A study tested the theory that an item that stands out from its background is better remembered than one that is similar to the background (the isolation effect). Specifically, the study examined whether the isolation effect would be greater when there was a larger and more confusing mass of background items, whether position of the isolated item would enhance memory for it and its surrounding items, and whether varying its position in a list would affect memory. Subjects, 44 college students, were presented with 12 lists of consonants on an overhead projector. Isolation of items was achieved by printing them slightly larger than other items on the lists. ANOVA was used to assess the number of list items and the number of isolated items each subject recalled. The factors analyzed were (1) type of isolate; (2) scoring (letters correct only if in correct position--strict scoring--and letters correct if recalled in any position--lenient scoring); (3) list length (9, 11, and 13 items); and (4) isolation (isolated and unisolated trigrams). Results showed that the isolation effect was in evidence and, at least for lenient scoring procedures, support the theory that the effect increased with increases in list length. This theory was not supported with strict scoring procedures, however. The findings suggest that isolation of an item improves item memory in proportion to its list length or weakness, but not position. (FL)

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THE ISOLATION EFFECT IN SIMULTANEOUSLY PRESENTED LISTS OF DIFFERENT LENGTHS

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(1) The isolation effect in simultaneously presented lists of different lengths

(2) (a) Learning-Memory
(b) Organization in Memory
(c) Memory Mechanisms

Problem

The environment normally presents vast amounts of information to us every minute of our conscious existence. This paper deals with how our processing of this information is related to the presence of outstanding items against a more homogeneous background. Historically it has been found that the outstanding item is remembered better and this has been referred to as the von Restorff or isolation effect (IE) (Wallace, 1965).

Specifically it is being hypothesized that the IE (i.e. the significantly positive difference between isolated and unisolated item performance) will be greater when there is a larger and hence more potentially confusing mass of background items. Cimbalo (1971), in the only other experiment known to have varied the length of the list containing the isolate, found no relationship between IE and list length. However a seemingly crucial difference is that in the earlier study a sequential presentation was used. The simultaneous-list presentation being used here has been shown to enhance performance for both the IE and the performance on the list as a whole (Cimbalo, 1977). For successively presented lists there is no evidence of an overall list facilitation effect (OLFE) but for simultaneously presented lists the evidence is strong. The meaningfulness and or pronounceability of the isolate was also varied. It is being hypothesized that the more distinctive isolates will increase the IE as well as the OLFE.

The results would seem to be of both theoretical and practical significance. Theoretically the issue can be viewed as one involving the effective stimulus. The successive presentation assumes an associationistic

or S-R orientation while the simultaneous permits perceptual and more complex strategic operations. Practically the simultaneous presentation of material is much more analogous to learning by reading.

Subjects

There were 44 subjects who served to fulfill an Introductory Psychology requirement.

Procedure

The subjects were presented with 12 lists of consonants individually stencilled on a transparency and shown by means of an overhead projector. The lists were displayed for a 2 sec./item duration. There were two isolated and two unisolated lists at each of the three list lengths. The lists were randomized and presented to all subjects in the same order. Isolation was achieved by printing items 4-6 in 9-, 5-7 in 11-, and 6-8 in 13-item lists in 5 mm high characters while the remaining list items were printed in 2.5 mm high characters.

Results

A 2 x 2 x 3 x 2 ANOVA was used to assess the number of list items and the number of isolates correctly recalled. The factors (and levels) were Type of Isolate (CVC and CCC), Scoring (letters correct only if in correct position, i.e. strict scoring, and letters correct if recalled in any position, i.e. lenient scoring), List Length (9, 11, 13) and Isolation (isolated and unisolated trigrams). The Type of Isolate was a between-subject variable and the remaining were within-subject variables. The .05 level of significance was used throughout.

Isolated Item Performance. Using lenient scoring the IE increases with list length as can be seen in the significant Scoring X List Length

X Isolation interaction plotted in Fig. 1. The foregoing triple interaction was significant for isolates correct with $F(2,84) = 7.29$. The largest IE is obtained for length 11 with smaller and comparable IEs at lengths 9 and 13 and as can be seen in Table 1 the *t* tests showed all IEs to be significant.

Insert Fig. 1 and Table 1 about here

Meaning and/or pronounceability enhanced the IE and a larger effect was found for the CVCs with $F(1,42) = 23.22$ for the Type of Isolate X Isolation interaction.

Overall Performance. The main effect of Isolation was significant with $F(1,42) = 50.22$ and the performance on isolated lists was superior. The Type of Isolate X List Length X Isolation interaction was significant with $F(2,84) = 5.25$ and the plot can be seen in Fig. 2 and the mean differences and *t*-tests appear in Table 2. In general there were larger facilitations due to isolation for longer list lengths but only for the CVCs.

Insert Fig. 2 and Table 2 about here

The type of Isolate X Scoring X Isolation interaction was significant with $F(1,42) = 4.42$ and it displayed larger facilitation effects for CVCs when strict scoring was employed. Overall facilitation effects were obtained for both strict and lenient scoring and CVCs and CCCs as isolates as shown by significant Scoring X Isolation and Type of Isolate X Isolation interactions with $F(1,42) = 17.25$ and $F(1,42) = 21.14$.

Conclusions

The IE was consistently in evidence and at least for lenient scoring procedures the hypothesis was supported that the effect increased with increases in list length. The hypothesis was not supported with strict scoring procedures where an inverted U-shaped relationship was obtained with an optimal effect for length 11. If strict scoring can be assumed to measure position memory in addition to item memory and lenient scoring can be assumed to be more a measure of item memory then isolation appears to improve item memory in proportion to its list length or weakness but not position memory.

As hypothesized, the OLFE did appear to be stronger with increasing list length but only for the CVC condition. With CCCs list length 11 appears to be optimal and no performance differences were obtained for lengths 9 and 13. Since both larger CVCs and CCCs would serve to bifurcate the lists into more clearly structured units the differences obtained would seem to involve the meaningfulness and/or pronounceability of the isolate. Perhaps the processing time spent encoding the CCC isolate in the 9 and 13 item lists did not allow for the more effective processing of the remaining list items.

Theoretically any simple associationistic interference theory explanation would seem incapable of accounting for the results. The relationship of the IE and the OLFE with list length depended upon the scoring procedure and the type of isolate respectively. The simultaneous presentation of material leads to a positive relationship of the IE with list length and to an OLFE which is in marked contrast to earlier results with a successive presentation. The strategy or stimulus-as-coded seems critical for an adequate explanation. Practically if meaningful material is highlighted or emphasized in material being read it will lead to better retention of the whole.

References

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Wallace, W.P. Review of the historical, emperical, and theoretical status of the von Restorff phenomenon. Psychological Bulletin, 1965, 63, 410-424.

Table 1

IEs (Isolated Minus Unisolated Item Performance)
for Trigrams Correct

Scoring		Strict	Lenient
List Length	9	.64*	.41*
	11	.90*	.61*
	13	.70*	.93*

* = t-test significant at .05 level

Table 2

OLFEs (Isolated Minus Unisolated List Performance)
for Overall Performance

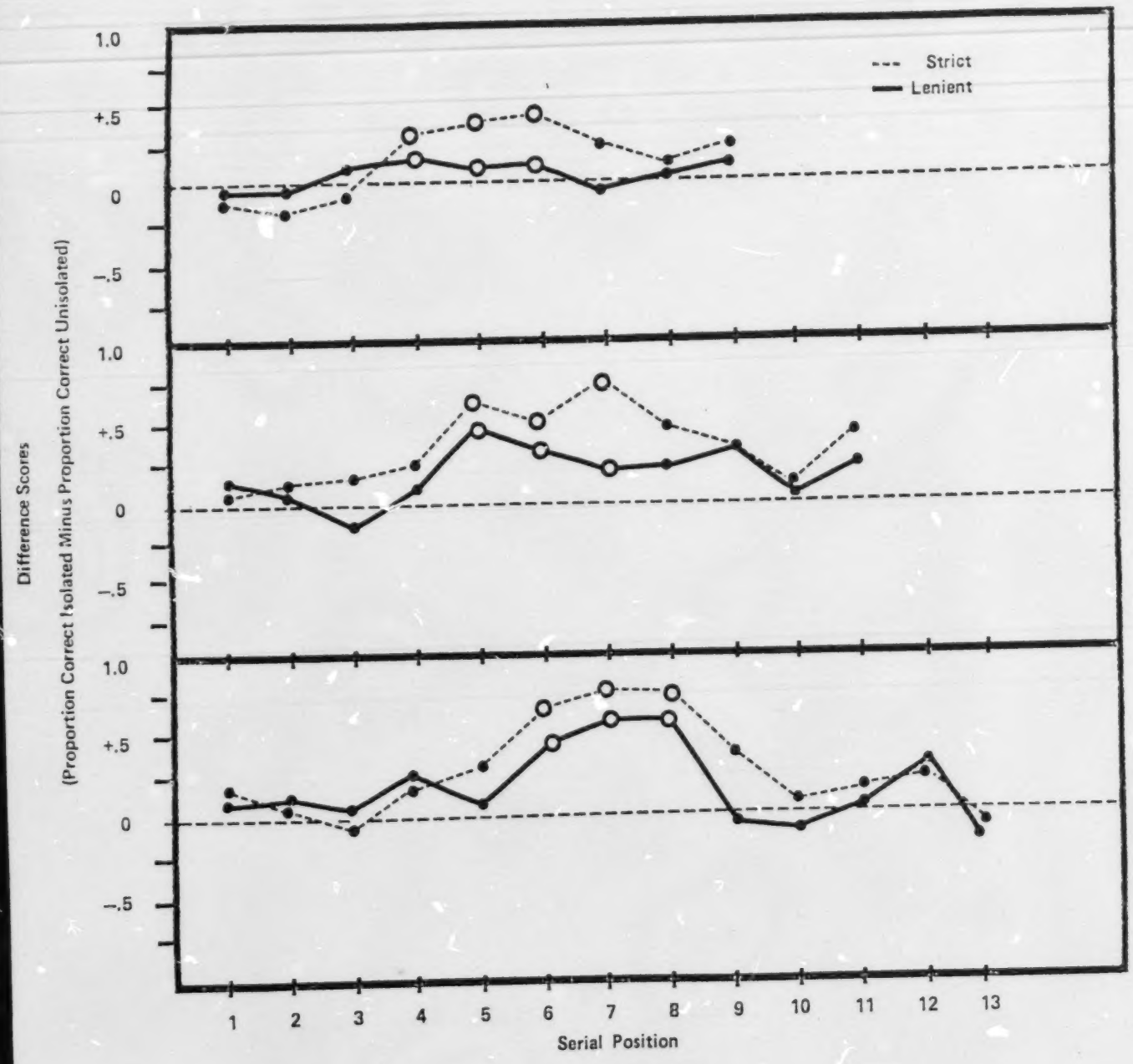
Type of Isolate		CVC	CCC
List Length	9	3.59*	-1.34
	11	3.59*	2.68*
	13	4.65*	1.18

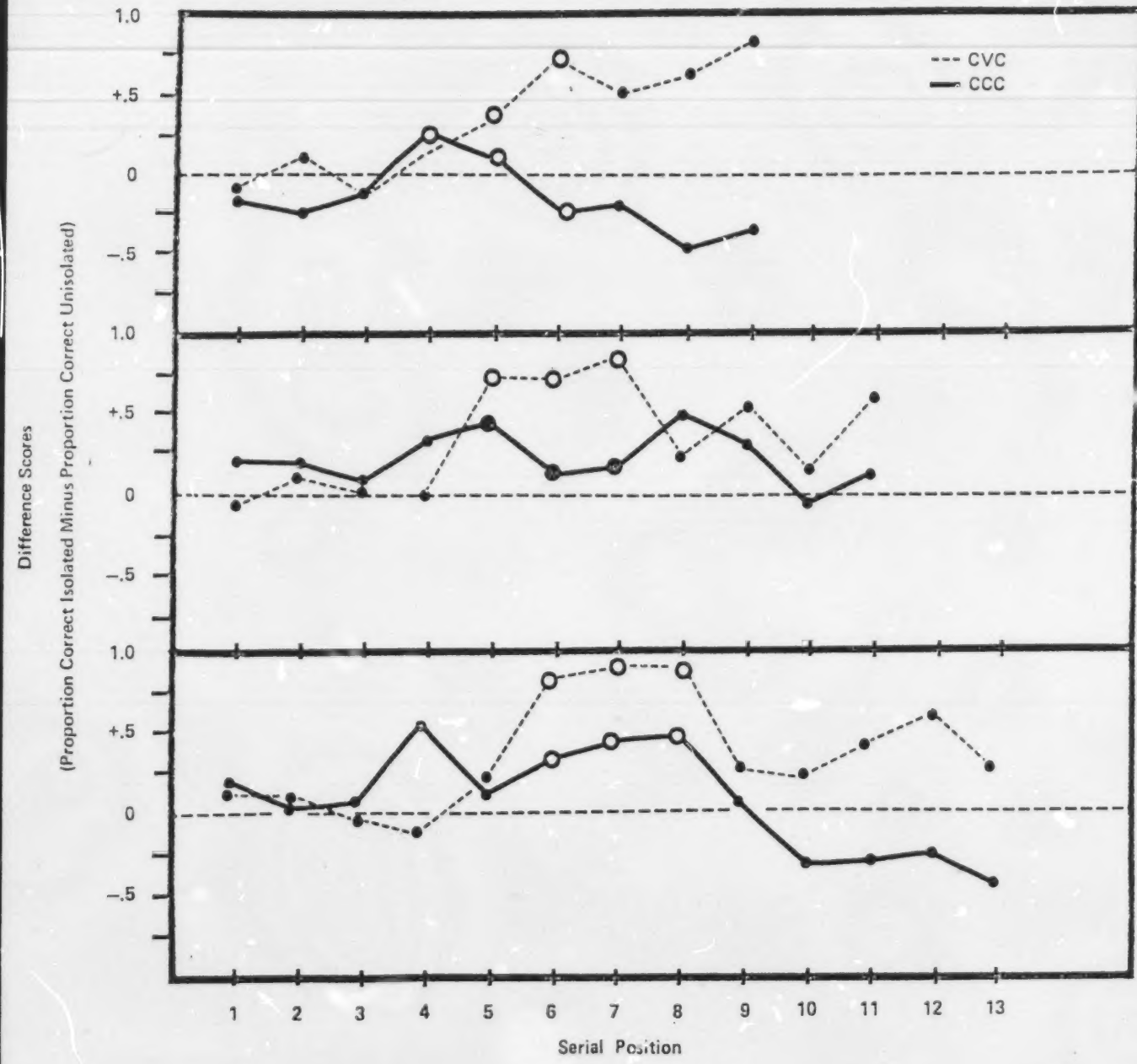
* = t-test significant at .05 level

Figure Captions

Figure 1. Difference scores for the strict and lenient scoring conditions plotted as a function of serial position with open circles(ɔ) indicating isolated items.

Figure 2. Difference scores for the CVC and CCC isolated trigram types plotted as a function of serial position with open circles(o) indicating isolated items.


Strict
Lenient
1.0
+.5
0
-.5
1.0
+.5
0
-.5
1.0
+.5
0
-.5
1 2 3 4 5 6 7 8 9 10 11 12 13
Serial Position
Difference Scores
(Proportion Correct Isolated Minus Proportion Correct Unisolated)


1.0
+.5
0
-.5
1.0
+.5
0
-.5
1.0
+.5
0
-.5
--- CVC
— CCC
Difference Scores
(Proportion Correct Isolated Minus Proportion Correct Unisolated)
1 2 3 4 5 6 7 8 9 10 11 12 13
Serial Position